Summary

QPF Process IWG Telephone Conference Call #2

Wednesday 2 February 2000

New Actions are Highlighted in Redline

Primary Discussion Topics/Actions

1) Inclusion/Exclusion of QPF in Revised Digital Forecast (RDF)

- Follow-up by Dave Ruth to APO action agreed to during 21 December Conference Call
  - Action (from 21 Dec): Ruth/OSD-APO. Implement AWIPS functionality to select/de-select QPF when generating RDF in Build 5.0.
  - Each WFO that prepares RDFs via ICWF currently has the ability to configure which elements appear in the product by editing a text file. Therefore an office can easily choose to either include QPF or not include QPF on a routine basis
  - Making QPF a menu selectable feature per forecast cycle requires changing the AWIPS database. APO experts informed Dave that we are now too close to the Build 5 deadline to add such a feature in time for AWIPS 5.0. Therefore, the earliest this feature could be included would be AWIPS 5.1.
  - Other note: If APO does include this toggle feature, does the forecaster selection need to made on a period-by-period basis or on a product-by-product basis? By default, the RDF includes QPF forecasts for five 12-hour periods. The Charleston office (and perhaps others) also includes an element called MAXQPF.
- Initial feedback from WFOs (mainly in CR) on requirement to make QPF a menu selectable feature per forecast cycle revealed
  - The functionality on a per forecast basis to include or exclude QPF in the RDF is not required.
  - Offices stated that they will either include or exclude QPF on a consistent basis.
- Polled each regional QPF Process IWG representative and a consensus decision was made to wait until the June-July 2000 OT&E is complete to assess if there is a WFO requirement to make QPF a menu selectable feature in the RDF.

- 7 September 2000: Analyze the results of the June-July 2000 OT&E and determine if there is a WFO requirement to make QPF a menu selectable feature in the RDF. Action: Peter Gabrielsen/ER, Noreen Schwein/CR, Ben Weiger/SR, and Norm Hoffmann/WR

2) Implementation of AWIPS Patch which will Enable HPC to Update and Amend Products

- In November 1999 Dave Reynolds diagnosed a problem with the routine issuance HPC products -- HPC forecasters cannot update/amend their products on AWIPS
- Dave Helms investigated and noted that the problem is not specific to QPF products, but systemic to the RBG product format due to the way RBGs are disseminated and the resulting logic AWIPS uses for processing segmented RBGs [Segmentation is the process of breaking products into smaller files in order to use the X.25 line between the NWSTG and the NCF. This results in AWIPS seeing multiple files with the same WMO header within short time frames and requiring AWIPS to reconstruct the segments into a single file.]
- Because NCEP/NCO currently segments RBG products, AWIPS cannot assume every time it receives a WMO file via the SBN it is a new and unique product. The file may be (and typically is) a segment of the same product with the same WMO file name received a few minutes earlier. Thus, AWIPS currently assumes products with the same WMO header (file name) received by AWIPS within short time intervals are actually the same product and not an update or a correction. For files received with the same file name within a few minutes, AWIPS attempts to concatenate them into a single product.
- AWIPS does not currently have the logic built into its RBG processing software to account for multiple versions (i.e., corrections, amendments, and updates) of the same product getting transmitted within short time intervals (minutes).
- Dave Helms submitted an AWIPS Discrepancy report (DR) in December and the APO is working to eliminate segmentation for RBGs and put RBGs on the NWSTG to NCF high speed line. Once this occurs, AWIPS RBG processing software can be changed to assume that each and every RBG file received via the SBN is a unique and whole product. Jim Ramer of FSL has corrected the problem and the patch has been checked into the AWIPS 4.3.1 baseline and will be deployed later this month.
- 25 February 2000: Test DR patch, which will enable HPC to update and amend

products, on the HPC and NHOW (SSMC2 14th floor) AWIPS workstations. Action: Dave Helms/OM, Dave Ruth/APO-OSD, and Dave Reynolds/NCEP

3) Implementation of AWIPS Patch to Display New HPC Products in D2D

- Discussed the following QPF Implementation Time Line task:
  January 28, 2000: Implement WFO and RFC AWIPS functionality (patch) to recognize, store, and display new (Redbook) graphical (Phase 1) HPC QPF products. Action: APO
  - The subset of HPC phase 1 products which required a new WMO header and an APO patch to display are: 1) the Day 3 24-h QPF; and, 2) the Day 2 probabilistic snow and icing product
  - APO developed and tested a patch prior to the deadline
  - The AWIPS Site Support team (SST) issued the patch to AWIPS regional focal points on 2 February
- Note: In early January, Dave Helms submitted a DRG RC to obtain WMO headers for new (Phase 2) HPC 6-h Day 2 and 6-h Day 3 QPFs (in Redbook graphics format) and coordinated an RC with the AWIPS CCB chair (Ward Seguin) to modify AWIPS software to display these new Day2 and 3 6-h graphic products via D2D.
  - The QPF Implementation Time Line lists an HPC implementation date for Phase 2 products of 31 May 2000
  - These Phase 2 products are already being generated and are available via the recently upgraded HPC homepage http://www.hpc.ncep.noaa.gov/qpf/qpf2.html
  - The DRG RC was approved and APO will provide the capability to display (Redbook graphic format) Phase 2 products in D2D with the release of AWIPS Build 4.3.1 later this month
  - 25 February 2000: Provide Dave Helms (OM) test files of the new Phase 2 HPC Day 2 and 3 6-h QPFs in Redbook graphics format. Action: Dave Reynolds/NCEP
  - 26 February 2000: Issue Public Notification Statement (PNS) for HPC Phase 2 product suite enhancements. Action: Tom Graziano/OM and Dave Reynolds/NCEP
  - 1 March 2000: Test end-to-end patch to display new HPC (Phase 2) Day2 and 3 6-h graphic products via D2D on NHOW (SSMC2 14th floor) AWIPS

workstation. Action: Dave Helms/OM and Dave Ruth/APO-OSD

- 6 March 2000. Begin routine issuance of Day 2 and 3 6-h QPFs in Redbook graphics format. Action: Dave Reynolds/NCEP

4) Review of DRG Requests for WMO headers

- RFC products
  - Gridded QPFs
    - ✓ On 19 January Dave Helms (OM) and John Bradley (OH) submitted a DRG request (DRG 2467 which superceded 2451) to obtain WMO headers for 6-h, Day1 through 3, gridded, HAS-modified RFC QPFs
      - ☐ QPFs will be GRIB-encoded and provided on the AWIPS 218 (10 km) grid [as was previously agreed to by the QPF IWG during our first meeting at NWSH]
        - ■ WFOs will be able to display via D2D the RFC QPF on the 10 km AWIPS 218 grid (see APO Implementation Time Line task dated 28 March 2000)
        - ■ NLT 31 January 2001 (AWIPS Build 5.0.X), WFOs will also have the capability to initialize GFE with 1) the 10 km gridded HAS-modified RFC and 2) a 10 km gridded CONUS HPC QPF
        - ■ Currently, GFE is only capable of being initialized with AWIPS series grids (e.g., 218, 215, 212, etc.), hence, the need for RFCs to convert QPF from the HRAP to an AWIPS series grid. This will enable the RFCs to more effectively support associated WFOs in the modified QPF process [additional note: transmission/storage of HRAP-gridded products require 5 times more bandwidth/memory than products on AWIPS 218 grid]
        - ■ RFCs which currently provide QPF to external customers on the HRAP grid will need to inform their external

customers of the grid/format change or continue to *also* make the QPF available on the HRAP grid

- Provision of RFC QPFs on the AWIPS 218 grid in GRIB format satisfies the RFC QPF data requirements of the NPVU

☐ Request included headers for individual RFC QPFs and a national mosaic of RFC QPFs [where/how this mosaic QPF will be generated has not yet been determined -- see item 5 below]

☐ The national RFC mosaic QPF will also be GRIB-encoded and provided on the AWIPS 10-km 218 grid

☐ The mosaic QPF product is necessary for the local modification/generation/issuance of QPF at WFOs since ~30% of WFOs support/are supported by multiple RFCs

☐ On 31 January 2000 OSO provided notification that the QPF IWG request to the DRG 2467 was approved: AWIPS CHANGE NOTICE NO. 0275A with an EFFECTIVE DATE: MARCH 22, 2000

✓ 1 March 2000: Provide Dave Helms (OM) and Lloyd Irvin/OSO information regarding where RFC QPFs must be transmitted to enable access by 1) HPC (for coordination and possibly generation of mosaicked QPF for use by WFOs) and 2) the NPVU (for verification). Action: Dave Reynolds/NCEP and Brett McDonald/OM

✓ 10 March 2000: Submit CR to DRG which includes RFC QPF product routing information to ensure QPF products are delivered to the proper destinations (i.e., WFOs and NCEP). Action: Lloyd Irvin/OSO and Dave Helms/OM

▸ Gridded QPEs

✓ RFC 1-h Stage III or equivalent products – DRG 2309

☐ Approved October 1998 with AWIPS change notice NO. 0131A with an EFFECTIVE DATE OF NOVEMBER 11, 1998

☐ For the 12 CONUS RFCs, these QPEs will based upon the Stage III/RFC-wide algorithm and provided in near real time (note: WR RFCs will not provide hourly 1-h Mountain Mapper based QPEs

since substantial resources, which are currently not available, would be required to modify Mountain Mapper to produce 1-h QPEs)

- ☐ Tim Sweeney of OH will provide all CONUS RFCs code to convert XMRG-formatted HRAP-gridded QPEs to GRIB format (see QPF Process Implementation time line action dated 15 February 2000)
- ☐ 1 March 2000: Provide Dave Helms (OM) and Lloyd Irvin/OSO information regarding 1) where the hourly Stage III or equivalent RFC QPEs must be transmitted to enable national NCEP Stage IV precipitation mosaic to be produced and 2) what the data cut off time is for NCEP/NCO to utilize these hourly analyses for NWP model initialization. Action: Dave Reynolds/NCEP
- ☐ 7 March 2000: Submit CR to DRG which includes RFC QPE product routing information to ensure hourly QPE (Stage III) products are delivered to the proper destination (i.e., NCEP). Action: Lloyd Irvin/OSO and Dave Helms/OM
- ☐ 7 March 2000. Submit DRG request for a WMO header for the hourly, gridded, NCEP national Stage IV QPE mosaic. Action: John Bradley/OH and Dave Helms/OM.

✓ RFC 6-h aggregate Stage III or equivalent products – DRG currently in DRAFT form and not yet submitted

- ☐ These QPEs will be quality assured by the HAS forecaster
- ☐ Will serve as ground truth for NPVU verification of QPFs
- ☐ At the 9 CONUS RFCs east of the Continental Divide, this product will be based upon the Stage III/RFC-wide algorithm
- ☐ At the CNRFC and the CBRFC, this product will be based upon the Mountain Mapper algorithm
  - ■ Note: the NWRFC does not utilize Mountain Mapper; therefore, NPVU verification of QPFs for the NWRFC will utilize gage observations as ground truth, and verification statistics will be generated for the pre-specified forecast points within the NWRFC domain, as is currently being done for the follow-on assessment in WR

- Code to convert Mountain Mapper grids into GRIB format is being developed by WR/CBRFC (see QPF Procss Implementation time line action dated 1 May 2000)

☐ 1 March 2000: Provide Dave Helms (OM), John Bradley (OH), and Lloyd Irvin/OSO information regarding where the 6-h aggregate Stage III or equivalent RFC QPEs must be transmitted to enable access by the NPVU for verification. Action: Dave Reynolds and Brett McDonald/NCEP

☐ 7 March 2000. Submit DRG request for WMO headers for the gridded RFC 6-h aggregate Stage III or equivalent QPEs. Action: John Bradley/OH and Dave Helms/OM.

- HPC Products
  - Gridded HPC 6-h QPFs
  - 6-h Nowcast, plus 12 6-h QPFs which comprise Days 1 through 3 – total of 13 products
  - Will be provided on the 10 km AWIPS 218 grid
  - These grids will be available to WFOs for initialization of GFE (and for use by external customers)
  - 1 June 2000. Submit DRG request for WMO headers for gridded HPC 6-h QPFs through Day 3 (13 products). Action: Dave Helms/OM and Dave Reynolds/NCEP

5) Generation of National Mosaic of RFC QPFs

- The gridded RFC QPF mosaic is necessary to support WFOs
- Need support for mosaicking software 24 hrs/day, 7 days/week
- Approximately 30% of WFOs support/are supported by multiple RFCs
- Grid will be displayable as an image in D2D
- Grid will be used to initialize of GFE at WFOs (which are supported by multiple RFCs)
- The national RFC mosaic QPF will be GRIB-encoded and provided on the AWIPS 10-km 218 grid
- Issue: RFC-HPC Coordination

- During Meeting 1of the QPF Process IWG at NWSH it was agreed that RFCs would transmit HAS-modified QPFs in VGF format back the HPC
- However, mosaicking of RFC VGFs will be problematic since contours, where modified, will be discontinuous between RFCs
- The solution will be for HPC to mosaic gridded RFC QPFs
  - ✓ HPC will need to convert GRIB-encoded RFC QPFs into GEMPAK (.grd) format and mosaic
  - ✓ CONUS mosaic will be displayable in NMAP
  - ✓ HPC could satisfy WFO requirement for mosaic of RFC QPFs by issuing RFC mosaic in GRIB format on AWIPS 218 grid (which is the same grid and format HPC will issue their own gridded QPF products on)
  - ✓ 10 March 2000: Assess whether HPC can satisfy the WFO requirement for a national mosaic of RFC QPFs. Action: Dave Reynolds/NCEP
  - ✓ DRG 2467 includes request for WMO headers for NCEP mosaic of RFC/HAS-modified QPFs
  - ✓ Since RFCs prepare QPF for input to NWSRFS later in the day in the Western U.S., this mosaic will likely need to be updated at least a couple of times per forecast cycle (i.e., RFCs in Eastern U.S. typically prepare QPF for input to NWSRFS earlier than RFCs in the Central U.S., who in turn typically prepare QPFs earlier than RFCs in the Western U.S.)

6) Development and implementation of AWIPS patches to a) display in D2D HRAP-gridded QPEs and gridded HAS-modified RFC QPFs (AWIPS 218 grid), and b) initialize GFE with gridded RFC and HPC products

- 22 February 2000. Provide Dave Helms (OM) examples copies of 1) an individual gridded QPF (cropped) for the ABRFC and 2) a CONUS gridded QPF. Both grids should be in GRIB format on the AWIPS 218 grid. Action: Brett McDonald/OM
- 26 February 2000. Submit RC to AWIPS CCB to enable WFO and NCEP AWIPS workstations to display individual and mosaic gridded RFC QPFs in D2D. Action: Tom Graziano/OM and Dave Helms/OM (see 28 March 2000 QPF Implementation Time Line task)

- 27 March 2000: Submit RC to add AWIPS capability to view in D2D a loop (or aggregate) of the 24 most recent hourly RFC Stage IV (QPE) analyses or a user-specified subset thereof. Action: Dave Helms/OM and Tom Graziano/OM
- 28 June 2000. Submit RC to AWIPS CCB to enable WFO AWIPS workstations to initialize GFE with individual and mosaic gridded RFC QPFs and gridded HPC QPFs. Action: Tom Graziano/OM and Dave Helms/OM (see 31 Jan 2001 QPF Implementation Time Line task)

7) Implementation of NMAP and generation of post-processing scripts

- NCEP/NCO will provide NMAP and guidance to implement the software at each RFC.
- Bill Lawrence has developed NMAP post-processing scripts to satisfy requirements outlined in Section 9.3 of the QPF Process IWG Meeting 1 Summary. Scripts can be tailored to any RFC and Bill is developing documentation for RFC implementation.
  - Developed script to convert HRAP-gridded GEMPAK format (.grd) QPF grids to XMRG format. Code additionally converts XMRG-formatted HRAP-gridded QPF into basin average FMAP text files for input to NWSRFS.
  - Modified existing code to generate GIF images of 6-h gridded QPFs. These GIFs will be posted to each RFC's website as was agreed at Meeting 1 of the QPF Process IWG.
  - Scripts do not yet include capability to generate GRIB-encoded QPFs on AWIPS 218 grid
    - ✓ Code to convert GEMPAK (.grd) format grids to GRIB has been developed by Keith Brill of HPC. This code is also capable of performing grid transformations (i.e., from HRAP to AWIPS series grids)
    - ✓ This code will not be included in NMAP when NCEP/NCO releases NMAP to the 9 RFCs east of the Continental Divide
    - ✓ Bill Lawrence suggested using Tim Sweeney's code to convert both QPE and QPF grids into GRIB format (Tim Sweeney's code converts XMRG to GRIB). However, this code currently cannot perform a grid transform from the HRAP grid to the AWIPS 218 grid and therefore cannot be used.
    - ✓ Consequently, Bill Lawrence will include Keith Brill's code in the list of scripts provide to other RFCs east of the Continental Divide

✓ 18 February 2000. Provide Bill Lawrence (ABRFC) a copy of Keith Brill's code which converts GEMPAK (.grd) format grids to GRIB. Action: Brett McDonald/OM and Dave Reynolds/NCEP.

8) NMAP Deficiencies

- Deficiencies as noted by Bill Lawrence listed in the order that they should be fixed (i.e., 1 = highest priority)

1. Need to "hardwire" lat/long points (8 to 10 numbers used to define the grid domain) into a table. Ata Dave Reynolds has discussed issue with Mary DesJardins and Mary has agreed to provide this functionality in near future.
30 March 2000. Add NMAP functionality which enables the MAKEGRID parameters to be table driven and provide updated software (Z-version release) to the 9 RFCs east of the Continental Divide. Action: Dave Reynolds and Mary DesJardins NCEP.

2. Problem with light precipitation amounts when performing graph to grid conversion. If single isohyet intersects RFC domain software is unable to determine which side of the isohyet to populate the grid with precipitation on. Brett McDonald has noticed this problem and suggests additionally rendering a zero or tenth of an inch line to eliminate.
25 February 2000. Inform HPC NMAP trainers that they should demonstrate the graph to grid problem for light precipitation events to ensure RFC forecasters understand how to resolve the issue. Action: NCEP

3. After converting a VGF file to a GEMPAK grid NMAP does not automatically display the grid. Forecasters would like the grid, once generated, to automatically, appear on the screen.

4. Converting VGF graphics to grids is time consuming -- takes ~60 sec per grid. No near-term solution.

9) Transfer of NMAP VGF files from HPC to the RFCs

- NMAP product generation currently outside AWIPS firewall
- HPC will ftp through AWIPS firewall and then ftp to a workstation at each RFC.
  - 3 March 2000. For each RFC, provide Dave Reynolds (NCEP) the following information to effect VGF file transfers from HPC to each RFC each of the Continental Divide: a) workstation IP address; b) file directory; c) user name; and d) password. Action: Peter Gabrielsen/ER, Noreen Schwein/CR, and Ben Weiger/SR
  - 10 March 2000. Develop strategy and complete testing of scripts to ftp VGF files to the RFCs. Action: Dave Reynolds/HPC

10) NMAP Training Plan

- Plan disseminated and approved by the QPF Process IWG
- HPC staff will provide NMAP training to HAS forecasters and other RFC staff members who perform the HAS function
  - Pete Manousos, Joey Carr, or Brett McDonald will provide an initial 1-2 day on-station NMAP training workshop to RFC staffs within 2 weeks of NMAP implementation
  - Only RFCs east of the Continental Divide will receive NMAP training from HPC
  - Follow-on training and training for RFC staff not in attendance for HPC training will be provided by RFC NMAP training focal point
    - ✓ 16 February 2000. Provide the name of the NMAP training focal point at each RFC east of the Continental Divide. Action: Peter Gabrielsen/ER, Noreen Schwein/CR, and Ben Weiger/SR
  - HPC will establish training dates at each RFC by coordinating with the RFC NMAP training focal point
  - NMAP implementation and training will be accomplished by HPC in phases similar to OT&E
    - ✓ 3 March 2000. Provide a list of NMAP training dates and instructors for all RFCs east of the Continental Divide. Action: Dave Reynolds/HPC

11) Transmission of HCMs and HMDs to NCEP and transmission of ADMNSTR messages from HPC to field

- SBN
  - HPC can receive all HCMs and HMDs transmitted via the SBN

- AWIPS WAN
  - HPC can receive messages, but can't send them using the Message Handling System (MHS)
  - HPC's AWIPS setup is a carbon copy of LWX
  - HPC cannot sent messages to the field using MHS [apparently, this capability has been disabled in order to avoid conflicts with Sterling WFO -- the real LWX AWIPS site]
  - HPC's AWIPS setup needs to have a unique AWIPS ID to send/receive MHS traffic
  - 10 March 2000. Submit DR to reconfigure HPC AWIPS with unique ID to send/receive MHS traffic unambiguously. Action: Dave Helms/OM and Lloyd Irvin/OSO.

12) HPC-RFC Event Driven Coordination Calls

- HPC will request/initiate calls via ADMNSTR messages
- RFCs will request/initiate calls via HCMs

13) Feasibility of effecting a transition from the use of XRMG to GRIB as the standard grid format for internal RFC use

- OH conducted assessment and determined that such a transition is not necessary, practical, or cost-effective
  - NWSRFS currently utilizes gridded data in XMRG format
  - GRIB format more difficult for data manipulation and conversion to use of GRIB would require costly and labor-intensive rewrite of NWSRFS code
  - RFCs will convert gridded data from XMRG to GRIB format prior to transmission

14) Development of QPF Process IWG Web Site

- QPF IWG agreed that web page would facilitate information sharing and coordination
- Michael Mercer (OM) implemented web site on 8 February 2000
- The web URL is non-searchable, non-password protected, and is not linked to the OM homepage
- The URL for the QPF process IWG is: http://www.nws.noaa.gov/om/qpi/qpf/iwginfo.htm